The information practices of Business PhD students.

Purpose: The aim of this study was to investigate how PhD students discover, choose and use information and literature for their research.

Design/methodology/Approach: Eight PhD students at the Norwegian Business School (BI) were interviewed. The interviews were based on a phenomenological approach.

Findings: The use of both library databases and Google Scholar is frequent and contextual. The informants ranked the library databases as more useful than Google Scholar. Methods for keeping up to date varied and were contextual. Although, formal information seeking in library databases was seen as more academic than the tracking of references this latter method was more widespread. Students felt they mastered the tools associated with formal information seeking, which constituted a continuous activity in their research practices. Wilson's (1983) theory on cognitive authority may give a better understanding of the findings.

Practical implications: Acquiring knowledge about the information practices of PhD students in a specific discipline will help libraries to improve their services and acquire relevant resources for their users.

Originality/value: This paper examines PhD students' ranking of information resources, identifies preferred methods for keeping up-to-date and reveals in which contexts the informants use either formal or social information seeking practices.

Keywords: Information practices, Library databases, Google Scholar PhD students, Business Discipline, Norway.

Paper type: Research paper

Introduction

The number of PhD students in Norway is increasing (Olsen, 2014), which implies that academic libraries should be aware of the information practices and needs of these future members of faculty staff. Results from such studies help librarians to tailor their services and resources to the needs of PhD students and support them in their transformation from students to scholars (Fleming-May and Yuro, 2009, p. 200). This research revealed that in the past few studies focused on PhD students as a user group with specific needs and practices. However, more recently, some interesting studies evaluating the use of information resources, such as databases and Google, among PhD students have been published (Carpenter, 2012; Gullbekk et al., 2013; Jamali and Nicholas, 2008; 2010).

In the investigation of information practices it is important to distinguish between `formal information seeking' and `social information seeking` (Seldén 2004, pp. 23-27). Seldén characterises 'formal information seeking' as librarians` tools; subject searches, citation searching, searching in library databases and using tools, such as alerts. 'Social

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information searching', is used to refer to what Wilson (2006) describes as 'recommendations from colleagues' or 'information exchange'.

In Norway, PhD students are temporarily employed as members of the faculty staff. For a period of three years they have a paid post and their own working space. The fact that they have their own office or work space seems to decrease the use of the physical library (Drachen et al. 2011). This differs from the situation in other countries, such as Australia, the U.K or the U.S, where they are regarded as fulltime students and therefore are more dependent on the physical library facilities.

The aim of this study was to contribute to an understanding of how Business PhD students in Norway perceive their own information seeking practices and to identify, which library services and information resources they use and regard as essential for their research and documentation. Accordingly, the research questions for this study were:

1) To what extent do PhD students attribute cognitive authority to library resources?
2) What roles do formal and social information seeking play in the research practices of Business PhD students?
3) How do they search for, up-date and select information and literature for their research?
4) How do Business PhD students in Norway rank library resources and services in comparison to Google?

Theoretical framework - Cognitive authority

To identify which information resources PhD students prefer or rely on, Wilson's (1983) theory about cognitive authority is most relevant. Wilson was mainly concerned with whether or not users credit librarians as cognitive authorities. In his research he found, that texts (including resources, such as journals and publishers) that are accepted by academic society (individuals, or groups of individuals) are often attributed as cognitive authority (p. 14), because: "We are prepared to trust the texts that one whom we trust tells us we can trust" (1983, pp. 166-167). Sundin et al. (2008), Neal et al. (2011) and Rieh (2005) extend the concept of 'texts' to include websites etc. Rieh (2005, p. 85), for example, maintains that information seekers "...select Web pages when there is some indication of source authority based on their own experience, other recommendations, or something they have heard".

The fact that a scientific association, a journal, or a publisher we trust has accepted a text leads us to ascribe this text cognitive authority, but the authority of texts can become outdated. The cognitive authority we ascribe texts is not related to objective quality indicators, but to "… how value or reputation are negotiated" (Sundin et al., 2008, p. 22).

Literature review – PhD students' use of library resources

Studying information practices has many objectives. One of them is to investigate needs and information seeking practices of different user groups, such as undergraduate or graduate students and researchers from different disciplines, to be able to invest in appropriate information resources (Urquhart et al., 2003). Information research skills develop from undergraduate to academic staff. In Fleming-May and Yuro (2009), informants refer to the transformation from undergraduate to graduate as being a transformation from a consumer of knowledge to a producer of knowledge. In this study, we focused on PhD students as a user group.

Doctoral students are expected to have expertise in filtering, analysing and synthesising large amounts of literature (Green and Macauley, 2007). A literature review is understood as a result of excellent information seeking skills, which "…bears with it understandings of previous research and theory..." (Green and Macauley, 2007, p. 326). PhD students perceive themselves as information literate and are satisfied with their information seeking skills (Carpenter, 2012; Fleming-May and Yuro, 2009; Gullbekk et al., 2013; Jamali and Nicholas, 2010; Tuominen et al., 2005; Urquhart et al., 2003). However, Gullbekk et al. (2013) identified a gap between the assessment of the supervisors and the students themselves regarding their ability to write good literature reviews.

Discipline and information practice

Business involves a mix of disciplines, it is a branch of social sciences with elements from economics (Seldén, 2004). Sundin et al. (2008, p. 22) note that: "An academic discipline `disciplines` its member to behave in certain ways...". Since, discipline affects information behaviour, it is important to identify each discipline's distinctiveness (Jamali and Nicholas, 2008; 2010; Rieh, 2005; Wilson, 2006). Discipline-specific differences are often explained by

the fact that the disciplines have different research cultures and traditions (Talja et al., 2007; Urquhart & Rowley, 2007). However, in contrast, Heinström (2005, pp. 242-243) concludes: "Psychological features were shown to have a stronger influence on the students' information behaviour than their discipline background, or the stage of the thesis process did". Jamali and Nicolas (2008) show that academic status also influences information seeking practice.

Prevalence and use of information resources

Gullbekk et al. (2013), and Drachen et al. (2011) present three recent studies investigating the information practices of Norwegian PhD students. Their information practices are shown to be well established and independent. The PhD students' sense of being valued and self-esteem is high and many maintain that the librarians lack knowledge about the research process.

There is a general view that Google or Google Scholar is the main information source for searching for literature, but figures from different studies vary. A recent and longitudinal study investigated the information-seeking practices of "Generation Y" Doctoral students (Carpenter, 2012; Carpenter et al., 2012). Over 13,500 students participated in the study. Carpenter (2012) concluded that these students were "sophisticated information-seekers and users of complex information sources". 30 % of all their respondents used Google/Google Scholar as their main source of information. 65 PhD student participated in a somewhat older study of Jamali and Nicholas (2008). Here *tracking references* was found to be the most used method for identifying articles (28 %). *Conducting searches in general databases* was used by 20 %, 15 % preferred Google/Google Scholar and 11 % *searched in subject databases* for this same purpose. 'The top ranked method to keep up-to-date' was *word of mouth* and *browsing e-journals* (26 %) and only 9 % ranked *searching in databases* as the best method (Jamali and Nicholas, 2008, Fig. 6.). In a Norwegian study (Gullbekk et al., 2013), the use of Google /Google Scholar as a main information resource is seen to be increasing, but not as widespread as was anticipated.

PhD students use a variety of methods to keep up with their field and their choice of method is contextual (Drachen et al., 2011; Gullbekk et al., 2013). Doctoral students initially

start with general databases and resources and, with more experience, go further with specialised databases (Green and Macauley 2007; Gullbekk et al. 2013).

Carpenter (2012) finds that if the younger PhD students cannot get the electronic version of an article, they are satisfied with the abstract. Easy access to full-text articles in electronic form, rather than relevance and quality, seem to be the most important evaluation criteria for PhD students when choosing literature for their project (Gullbekk et al. 2013; Drachen 2011; Sentio Research 2010). These criteria can lead them to ignore important literature for their research. The Generation Y students do not care about who the publisher is, or the origin of the journal and they seem not to be influenced by peer reviews or citations as markers to evaluate the legitimacy of research (Carpenter, 2012).

Sentio Research (2010) found that science students are more likely to use Google, while students in social sciences use the library databases more. Jamali and Nicholas (2008; 2010) found significant differences in information seeking patterns between different sub-disciplines of astronomy and physics. Inter-disciplinarity also affects information behaviour, for example, it may involve the use of more general search facilities and techniques (Jamali and Nicholas, 2010). Carpenter (2012) reports that Google sources were preferred by students in most disciplines except in biology and biomedicine. However, Jamali and Nicholas (2008) reported that less than 3% of PhD students *relied* on Google Scholar.

Managing references is an important skill in the research process (Meho and Tibbo, 2003). However, Drachen et al. (2011) found that reference management tools are not as widely used as would be expected. Reference management skills were regarded as the least important research skill. The use of reference management tools was higher in the universities of Oslo and Copenhagen than in that of Vienna. In the 2010-survey presented in Carpenter (2012), 58 % of the students reported that they used some kind of citation or reference management tool but are not found to be early adopters of new technology for research.

Searching the library catalogue is necessary to locate and access library materials and although the PhD students in Carpenter et al. (2012) ranked the library catalogue as quite important this was one of the facilities they were least satisfied with. However, in the Norwegian studies the library catalogue (BIBSYS [Biblioteksystemer] Library System)) was

perceived more as a hindrance than an efficient tool for information retrieval (Gullbekk et al., 2013, p.61; Sentio Research, 2010).

Drachen et al. (2011) and Sentio Research (2010) studied broad disciplines, such as social sciences, science and the arts and humanities.

Inspired by this literature, this article focuses on PhD students in business studies to uncover if disciplines affect information practices.

Important indicators for formal information seeking skills are competences in subject searching, citation searching, use of alerts and reference tracking or chaining. Ellis (1993) described different generic features of information seeking practices among social scientists: starting, chaining, browsing, differentiating, monitoring and extracting. Meho and Tibbo (2003) revisited Ellis' study to include Web technology. Through this process, they added: accessing, networking, verifying and information managing, as important features to describe information seeking processes. The processes are described as sequential practices, but in their everyday practice they are mixed in sequence; based on context and needs (Ellis, 1993; Meho and Tibbo, 2003). Berger and Luckmann (1967) claim that habits make everyday practices easy and emphasise this as an important `energy saving` aspect. Foster & Urquhart (2012) underscore the non-linear nature of the information seeking process.

This literature review shows that information seeking practices are affected by disciplines, sub-disciplines and inter-disciplinarity, generation, habits, academic status and psychological features. There are few recent studies about information seeking practices among researchers in business disciplines and especially on PhD students. It is also of interest to examine whether social information seeking is common in the Norwegian setting, where the students meet the faculty during the day. In reviewing existing literature, there was no ranking of specific information resources and little was found on how PhD students perceived different information seeking methods (Gullbekk et al., 2013).

Methodology/Procedures

This article discusses a case study of PhD students attending the Norwegian Business School`s PhD courses (60 European Credit Transfer and Accumulation System is mandatory). An

invitation to participate in qualitative interviews was sent to all PhD students and eight students gave a positive response to be interviewed during spring 2012 (29 % of the population, n=57).

Informants	Age	Period (years) of PhD employment	Main subject
John	32	2,5 (nearing end)	Marketing
Vera	29	3 (nearing end)	Leadership and Organisational Behaviour
Roger	38	2 (nearing end)	Strategy and Logistics
Ruth	36	0,2 (recently started)	Leadership and Organisational Behaviour
Ann	33	0,4 (recently started)	Leadership and Organisational Behaviour
Beth	26	0,5 (recently started)	Leadership and Organisational Behaviour
Maria	27	1,5 (half-way through)	Finance
Jean	40	5,5 (nearing end – includes maternity leave)	Strategy and Logistics

Table 1. List of informants

Norwegian business School (BI) has six PhD programmes and four of them were represented in the sample. The majority of the informants represented disciplines such as organisational psychology, marketing, strategic management and only one of the informants came from finance. Their ages varied from 26 to 40 (the median and mean age was 32). The participant sample included six female PhD students and two male. From the total population of 57 PhD Business students, 28 were from countries other than Norway and 23 were female. The sample was small, but reflected the variation of the population according to age, research subjects and research experience. A small sample can be defended when the focus is to explore and understand a specific phenomenon (Kvale and Brinkmann, 2009), such as PhD students` use of information resources.

Interviews

The study took a qualitative approach; in-depth interviews with a phenomenological perspective were chosen as the main method and strategy. In a similar way to Green (2010), we wanted to acknowledge the students narratives and "…valuate their prior knowledge" (p. 315).

According to Pors (2010) different research designs give different responses to nearly the same question and using mix methods adds credibility to a study. In this case, before starting the interviews the participants filled out a questionnaire with demographic data (gender, age, and department). The informants also ranked their use of different databases to establish whether they described their use of library databases differently when answering a questionnaire to in the interview. (The ranking markers used were: Very Useful/Useful/Not Useful/Not Familiar).

The interviews lasted from 40 to 90 minutes and were conducted at the informants' institutes. Two interviews were conducted in English. The semi-structured interviews were based on an interview guide that provided an opportunity to control the interview and which strengthened the reliability and comparability of the study findings (Ringdal, 2013). The interview guide was inspired by the questions used in the Gullbekk et al. (2013)[1] and Drachen et al. (2011) research. This study concentrated on information seeking practices. The main focus was to capture how students perceived and ranked library information resources, how they managed information and how they kept up to date. These categories were inspired by Ellis (1993) and Meho and Tibbo (2003). It was important to examine the PhD students` narratives of their everyday-life as researchers. They were asked to describe how they search for information and literature, how they become aware of relevant literature, which methods they use and how they use library databases and Google/Google Scholar. It was also of interest to provide space for them to describe their feelings connected to search processes.

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[1]The Norwegian version was published in 2012

All interviews were audio-recorded and transcribed, analysed and thematically coded using NVivo software (www.qsrinternational.com). The analysis focused on expressions and utterances. The coding was data driven and inspired by the interview guide. Through an iterative process we focused on 'expressed meaning' and identified categories. The categorisation process "[…] entails a more systematic conceptualisation of a statement" (Kvale & Brinkmann, 2009, p. 2002). The Norwegian citations from the interviews and survey are translated into English and marked with an asterisk: '*'.

Findings

Below we will describe the findings. They are analysed and reflected upon in the discussion section.

Unexpectedly, several of the informants opened the interview session by stating that they did not use the library any more. Working electronically they did not realise that they were "heavy library users". However, during the interview, all of them confirmed that the library's resources were useful and essential for their research. Vera stated: "The BI library is indispensable, it gives me access to the resources that are very important for my every day practices"*.

Formal information seeking practices

The informants felt that they mastered the tools associated with formal information seeking, for example, John, who responded: "I consider myself an expert"*. The informants knew about truncations, the importance of choosing the relevant keywords and also how to read bibliographic information and records in databases giving information about embargos, inter-library loans, virtual private network (VPN) and named databases. Vera confirmed that her PhD fellows mastered the basic information seeking processes, although, she and other PhD students did not master the "features that exist, like citation searching or how to find the core article etc."*

Formal information seeking was an important part of their information practices. Vera stated it was: "[…] something I do all the time, because one cannot say or write anything without referring to others. It is a continuous process"*. Although she was beyond

the in-depth literature search phase, she had already visited the database `Psych Info` 3-4 times before 10 o'clock in the morning.

None of the interviewees described the information seeking process as frustrating; instead many of them enjoyed the process. Maria pointed out patience as an important characteristic of research and continued: "I can spend like five hours searching for something [...], I find it exciting actually". On the other hand the experienced informants expressed more concern about being able to cover the core literature in their field. This anxiety increased as the date for submission approached.

Preferred methods. There was great variation, both between individuals and in relation to context, in the methods used to discover new literature and keep up to date. Five of the informants subscribed to different kinds of alerts; from tables of contents direct from the journals, from databases, or topic alerts from databases, Google Scholar, journals, or publishers. In contrast, Ann did not subscribe for alerts so as to protect herself from 'information overload'.

Reference tracking was an important and widespread method for keeping up to date and to become aware of new literature. This was regarded as an easy way to find important contributions for their research. Inspired by course syllabus, they start to search for references to track. They adapt the information seeking methods to fit different contexts. Maria explained: "The first thing I do with an article I find is to look through the references and then search for them. But for a new topic I use the subject search. I use a mixture".

Subject searching was surprisingly widely practiced, but not as common as reference tracking. This method was very contextual and mostly used to discover literature on new topics or when ideas were very vague. Ann, one of the recently employed informants, said: "I don't search that systematically" and found subject searching too extensive, but more academic than reference tracking. Most of the PhD students preferred to use the library databases for subject searching. Google Scholar was not regarded as appropriate for this purpose, except by one informant. On the other hand, two respondents expressed that Google Scholar was an excellent tool for identifying good keywords.John said: "[....] one has to find the essential articles, [then] you look at important citations and repeated key words

and concepts"*. Jean confirmed using Google or Google Scholar to find keywords to use, almost as a dictionary and then continue the search process in databases.

Citation searching is a more systematic way to track references and was not as widespread as reference tracking. Only four of the informants said they used the search method systematically. Google Scholar was the most important tool for searches, but also the Web of Science.

Evaluating texts. The informants were familiar with academic quality indicators, such as impact factors, numbers of citations in the *Web of Science* or *Google Scholar*, the Norwegian register for authorised publication channels characterising publications as level 1 or level 2 and the Financial Times journal ranking, which figures as the highest status for publication points at BI. There was however, only one informant who fully relied on such indicators.

> "I don't not look at that. It has nothing to do with the knowledge, information or added value of a research paper. It may be that the author is less known, but it can add valuable information and perhaps move the research frontier" (Maria)

John states that: "...being a researcher you have to evaluate what is good scientific work in different fields"*. Jean, who is near finalising her thesis, is very concerned with formal indicators; she had to follow the scientific conversations in level-2-journals, since her articles were meant to be published in a `level 2` journal and citations became obviously more important.

Social information seeking

Recommendations from others, however, were not a very common resource for information seeking, though exchanges did take place. Quite early in the PhD study period the students regarded themselves as 'experts' and did not feel that anyone could really help with their research topic specialisation. Ann expressed it in this way: "I think it is like when you`re getting into such a narrow subject, it becomes kind of your own subject. I don't know if anyone I work with would be so interested". Only two of the informants used social information seeking as an active method, consulting faculty members they relied on or who

were very positive to knowledge sharing. This was not necessarily their supervisor. For Roger this was a preferred method when he was starting on a new project and Maria, from finance, said: "[…] there are exchanges such as: `I found this or that article`; the degree of trust is high!". After a year or two PhD students start to participate in conferences and to contribute to the scientific discourse in their field. They build their own academic networks outside BI and use this for knowledge sharing and generating. Librarians were not recognised as having any role or position in this informal information seeking process.

Ranking information resources

The preferred information resources, the method regarded as most appropriate for the research and the kind of alerts subscribed to, may also be based on habits, rather than a continuous selection process based on quality control. This is illustrated by Ann's comment: "[...] once I became familiar with *Business Source Complete*, then that's been what I use".

In the questionnaire the participants were asked to rank information resources. Important library databases and Google Scholar resources at BI were listed and they could also add resources they considered important.

Business Source Complete(BSC) was considered the most important resource by the PhD students in this study; six ranked it `Very useful` and one `Useful`. Many of them mentioned and referred to this database also during the interview. The respondent who ranked it as 'Not familiar', had been employed for the shortest time. By the end of the interview, she also judged BSC and *PsychInfo* to be important and relevant for her.

In the questionnaire, six of respondents ranked the library catalogue *BIBSYS*[2], as `Very useful` and one `Useful`. This placed BIBSYS as the second most important information resource for the informants as a group. The respondent who ranked it `Not very useful`, did use it when searching for and ordering books. However, in the interviews several of the informants talked critically about BIBSYS and some of them were rather angry. Roger, for

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[2]During the Autumn of 2011 the BIBSYS consortium (library catalogue) had terminated the agreement with the supplier of the link manager (Online Computer Library Center). This lead to difficulties in accessing electronic articles and one was forced use the library catalogue and not Google Scholar, to get access to the articles.

example, had tried many of the options in the catalogue and he gave examples to demonstrate how bad his experiences with the user interface were.

Google Scholar and the Web of Science were ranked as the third most important resources in the survey. In the interviews the informants talked more about Google Scholar than Web of Science and showed wide variation in their use of these resources. More unexpectedly, Journal Storage (JSTOR) was ranked as the fourth most important resource, only one of the informants did not know this database.

The use of library databases and Google Scholar were complementary and resources were used in different contexts and for different purposes. Informants experienced that library information resources were more academically robust than Google or Google Scholar. Interestingly, it was the most experienced PhD students, who relied on Google/Google Scholar. They were able to search more precisely and separate out relevant articles quickly. The informants were aware that the library had a lot of the articles available through Google Scholar.

Tools and technology

All respondents favoured electronic access to the literature. However, all but one preferred to read from paper. If they wanted to study a book or an article, it was important for them to order it from the library, or even to buy the book. All the informants used reference management tools, such as Endnote and Zotero.

At the end of the interviews, many of the informants concluded that they should start searching in database X or Y, conduct more citation searches, sign up for alerts, or update their alerts.

Discussion

By investigating which resources PhD students regard as important for their research, we can identify the items to which they attribute cognitive authority. Although all the respondents shared the misconception that they were not library users anymore, they confirmed that they were heavy users of library resources. The physical library and books

constitute the library as a phenomenon, but they concluded that the library plays an essential and important role in their research performance done in their own office. The findings of this study confirm statements about formal information seeking being an important part of their information practice (Seldén, 2004). Information seeking is an activity that constitute their role as researchers (Green and Macauley, 2007; Tuominen et al., 2005).

The informants ranked the library resources, such as *Business Source Complete* and *BIBSYS* higher than *Google Scholar*. The *Web of Science* was ranked equal to Google Scholar in the questionnaire. During the interviews, the ranking from the questionnaire was confirmed, but it was obvious that the use of *Google Scholar* was higher than the questionnaire indicated. This confirms findings from Sentio Research (2010), where the PhD students in social sciences, reported more use of library databases than their fellow science students.

In Jamali and Nicholas' (2008) study it was seen that only 3 % of the PhD students relied on information found in *Google Scholar*. However, the study was undertaken early in the age of *Google Scholar*. Carpenter (2012) showed that only 30 % preferred *Google/Google Scholar*. The informants from BI used *Google Scholar* to a greater extent, but ranked it lower and perceived the resource less academic than library databases.

The informants from BI rely on the *Web of Science* and seven of them regarded it as `Very useful`/`Useful`. They used it primarily for information searching and to get information about impact factors, rather than for citation searches. In Jamali and Nicholas' study (2008), the young researchers rely on the *Web of Science* to a greater extent than the mature researchers.

It is interesting to examine why the respondents ranked *JSTOR* as so important? When searching for articles in *Google Scholar* one will often be directed to *JSTOR.* Fleming-May and Yuro (2009) concluded that this situation must be a result of strong branding from *JSTOR*. The BI library does not disseminate this resource, so its high score as judged by our informants seems to be a result of their own evaluation of the resource.

The library catalogue, *BIBSYS*, was ranked as the second most important information resource. However, several of the informants expressed their frustrations with it in the interviews. This might be a consequence of the change in the procedures to access full-text articles. However, Gullbekk (2013) and Sentio Research (2010) also confirm the negative

perceptions of *BIBSYS* as a hindrance for their research respondents. Informants in Carpenter (2012) similarly ranked library catalogues as important, but the type of information resource they were least satisfied with.

Preferred information resources might be a result of habits, as Ann responded and Berger and Luckmann's (1967) findings corroborate; the arguments about time saving aspects of habits are very relevant. Time saving is an important issue for PhD students and Gullbekk et al. (2013) claim that library resources are an important area for efficiency improvement. The informants perceive the library resources as more academically robust than *Google Scholar* and *Google.* Even those, who preferred to use *Google Scholar*, perceived the library resources as a `Very useful` information resource for research purposes. On the basis of this, we conclude, in line with Wilson (1983); Rieh (2005) and Sundin et al (2008), that the informants attribute cognitive authority to library resources.

Results from both Norwegian and international surveys, argue that doctoral students are satisfied with their own information seeking skills (Carpenter, 2012; Drachen et al., 2011; Fleming-May and Yuro, 2009; Gullbekk et al., 2013). The methods the informants in this study used and how they worked seem to be based on context and needs. None of the informants described their practices as very systematic and corresponds with the conclusions of Foster & Urquhart (2012); Ellis (1993) and Meho and Tibbo (2003). In the BI study we saw that both reference tracking and subject searching are widely used methods for keeping up to date. Choosing methods seems to be contextual and dependent on purpose. Reference tracking was regarded as easy and not very time consuming. When student ideas were vague or their topic was new, most of them found searching for subjects an appropriate method. Gullbekk et al. (2013) and Jamali and Nicholas (2008; 2010) indicate reference tracking as the most widely practised and preferred method to discover literature.

Social information seeking to discover new literature (Seldén, 2004; Wilson 2006) was acknowledged as an appropriate and easy method by two of the informants, who were both avid users of library resources. The other informants perceived their topic to be so specialised that none of their colleagues or even their supervisors could recommend relevant literature. The informants also disliked to ask or interrupt others by asking. Jamali and Nicholas (2008; 2010) showed that PhD students in science disciplines are more likely to

depend on recommendations from others, while Sentio Research (2010) identified that members of smaller disciplines prefer this method. One would expect social information seeking methods to be more widely used at BI where the PhD students have easy access to faculty members.

In both Carpenter (2012) and Drachen et al. (2011) the informants were critical about using quality indicators, such as impact factors, journal levels and citations to select literature. Most of the BI informants seemed to share this critical view and were aware of their responsibility as researchers to evaluate the quality by both formal criteria and their own quality judgement. This might also indicate that cognitive authority assigned to authors and journals are decreasing. In Sentio Research (2010) the PhD students reported that it was important to read articles published in journals "high up in the hierarchy". Informants in their study were mostly drawn from science disciplines, which might suggest that their responses indicate a difference in literature selection between disciplines. Gullbekk et al. (2013) and Carpenter (2012) indicate that there are signs that imply a move towards using access as a criterion for selection instead of quality criteria. If students are unable to get an e-version they do not go any further. This might be a shift, which would imply that important classical literature would be ignored. In our study this was not an obvious outcome; the respondents all ordered or bought literature if they perceived it as important.

Only one of the more mature informants read e-books on the screen. The informants, in general, preferred the e-version of articles and books, not to read on the screen, but as easy access for a print out. They seemed not to be early adopters of technology (Carpenter, 2012).

The informants felt they mastered the search techniques and used different information resources based on context and purpose. All informants used reference management software, which was unexpected, since this fact differed from findings in other corresponding surveys (Carpenter, 2012; Drachen et al., 2011; Gullbekk et al., 2013).

The knowledge creating aspects of interviews (Kvale and Brinkmann, 2009) inspired several of the informants to start searching in certain database, to conduct more citation searches and to sign up for or update their alerts.

Conclusion

The informants perceived their formal information seeking skills as appropriate. During the interviews most of them realised that there were some features and skills, which might make their everyday life as a researcher easier and more effective. They were avid users of library resources and did not seem to lack any resources. The study reveals that use of library databases and formal information seeking techniques are still seen as advantageous and perceived as a more academic and robust tool for information seeking. The informants ranked the library resources higher and more academically robust than G*oogle Scholar*. The choice whether to use the library's information resources or Google Scholar depends on the context, purpose and habit. However, *Google Scholar* was perceived as most convenient and was used extensively.

Wilson (1983) emphasised the continuous approach one needs in order to renew aspects of cognitive authority and ensure impact. This study indicates a slow move towards what seems to be 'non-library' products in the information practices of the PhD students, but also that the students are aware of the library`s role as a supplier of the academic literature in Google Scholar. The wide use of and trust in library information resources suggests the attribute of cognitive authority to these resources and acknowledgement that the library is an important supplier of research support.

Based on new knowledge of how Norwegian business PhD students perceive their information retrieval skills, it will also be of interest in further research to investigate how PhD students acquire their information retrieval skills and whether they perceive the librarian as an important support in their research processes.

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